Mohammadi et al. Middle East Fertility Society Journal (2020) 25:6
https://doi.org/10.1186/s43043-020-0018-6

Middle East Fertility Society Journal

REVIEW Open Access

Assisted reproductive technology and the risk of gestational diabetes mellitus: a systematic review and meta-analysis

Maryam Mohammadi[1,2], Esmaeil Khedmati Morasae[3], Saman Maroufizadeh[4*], Amir Almasi-Hashiani[5], Behnaz Navid[1], Payam Amini[6], Reza Omani-Samani[7] and Ahad Alizadeh[8*]

Abstract

Background: The use of assisted reproductive technology (ART) is increasing worldwide, and observational studies have indicated that women who conceived by ART have an increased risk of pregnancy complications including gestational diabetes mellitus (GDM). We aimed to determine the risk of GDM among women who conceived with ART by systematic review and meta-analysis.

Main text: A systematic literature search was conducted in ISI Web of Knowledge, MEDLINE, Scopus, and Embase through May 2017 for English-language articles using a list of keywords. All studies comparing GDM in women conceived by ART and those who conceived spontaneously were included. Data extraction was performed by two authors independently and discrepancies were resolved by discussion. In total, 48 studies with 91,487 pregnancies conceived through ART and 2,525,234 spontaneously conceived met the inclusion criteria. There was evidence of substantial heterogeneity among these studies ($P < 0.001$, $I^2 = 98.6\%$). Random effects meta-analysis showed a significant increase in GDM among those who conceived by ART compared with those who conceived spontaneously (pooled relative risk = 1.51, 95% confidence interval = 1.18–1.93). Visual inspection of the funnel plot did not reveal any publication bias, which was supported by Egger's test and Begg's test.

Conclusion: The findings of this systematic review indicate that the use of ART treatment is associated with a 1.51-fold increase in GDM. Women need to be counselled carefully before undergoing ART treatment about the possibility and risk of GDM.

Keywords: Assisted reproductive technology, Gestational diabetes mellitus, Infertility, Meta-analysis, Systematic review

Background

Assisted reproductive technology (ART) is a group of medical methods for treating the infertile human in which both male and female gametes are used outside the body to achieve pregnancy [1]. To date, approximately 5 million babies are born worldwide via ART [2]. Although ART may help infertile couples, its use has increased concerns associated with pregnancy-related complications and adverse consequences [3]. It has been suggested that obstetric outcomes in gestation after ART are poor when compared with those pregnancies spontaneously conceived [4]. Moreover, evidence from meta-analyses [4–8] has revealed that singleton pregnancies after ART are at higher risk of adverse consequences than those conceived naturally. One of the outcomes followed by ART is gestational diabetes mellitus (GDM) and is known as one of the most common complications in pregnancy [9, 10]. GDM is defined as "carbohydrate intolerance of variable severity with onset or first recognition during pregnancy" [11]. GDM is a worldwide public health problem and complicates about 7% of all pregnancies [12, 13]. The cause and pathogenesis of GDM is both multifunctional and complex [14]. GDM is prone to causing a woman and her baby a wide range of complications during pregnancy and in later life [15, 16]. women with GDM are more

* Correspondence: saman.maroufizadeh@gmail.com; st.alizadeh@gmail.com
[4]School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran
[8]Metabolic Diseases Research Center, Qazvin University of Medical Sciences, Qazvin, Iran
Full list of author information is available at the end of the article